

### **In the Drawings**

Kindly replace Figs. 1 and 2 with the substitute Figs. 1 and 2 submitted herewith. In accordance with the Examiner's helpful suggestion, these figures have been made larger so that the detail regarding the movement of the plate 3 can be more clearly seen. In addition, the reference numeral 1 is now used to identify the tubular member only. Reference numerals 6 and 11 have been added to identify the annular zone and source, respectively. In addition, reference numeral 12 has been added to identify the connecting flange. Also, support rod 10 is now shown and reference numerals have been added to identify support rods 7, 9 and 10. Reference numeral 3 has been added to Fig. 1.

Kindly replace the drawing sheet showing Figs. 3 and 4 with the substitute drawing sheet included herewith. Fig. 4 has been amended to show reference numerals 7, 9 and 13. Reference numerals 7 and 9 identify support rods. Reference numeral 13 identifies the spring loaded push ring.

Kindly add new Fig. 5, which shows the angularly mobile plate 3' forming a dihedron variable with the plane of the diaphragm.

Kindly replace original Figs. 5-7 with renumbered Figs. 6-8, respectively. Also, renumbered Fig. 7 has been amended to delete the numerals 0, 1, 2, 4, 8 and 16.

### **Remarks**

The Examiner's detailed and thorough review of the application is noted with appreciation. Likewise, the Applicants thank the Examiner for the numerous helpful suggestions provided in the Official Action. Many of the suggestions have been adopted herein.

The indication that claims 1-4 and 6-9 would be allowable if various rejections under 35 U.S.C. § 112 were overcome is also noted with appreciation. It is believed that the amendments and remarks submitted herewith place the claims in condition for allowance.

### **Objections to the Drawings**

The Examiner's observation, that the angularly mobile plate that forms a dihedron variable with a plane of the diaphragm is not shown in the drawings, is noted with appreciation. New Figure 5 has been added to show this feature. Support for the new figure can be found in the original specification at paragraph 0019 (paragraphs 0010, 0026 and 0036 of the Substitute Specification) and original claim 5. The original disclosure describes two embodiments of the invention. According to the first embodiment, the plate is mobile in a direction perpendicular to the diaphragm. In the second embodiment, the plate is mobile angularly so as to form a dihedron with the plane of the diaphragm. The second embodiment is shown in the new figure.

Based on a fair reading of the specification, one skilled in the art would understand that the Applicants envisioned the full scope of the embodiment of new Fig. 5 and had possession of the subject matter shown therein at the time the application was filed. Specifically, the originally filed specification provides the skilled artisan with sufficient guidance to understand that the plate 3' of the second embodiment moves in a pivotal (*i.e.*, hinged) manner, wherein a portion of the plate 3' that is tangentially attached to structure within the plane of the diaphragm remains in place while the

rest of the plate 3' moves relative to the diaphragm to form a dihedron with the plane of the diaphragm. The meaning that one skilled in the art would attribute to the term "dihedron" is discussed below. Because the written description supports new Fig. 5, and because the skilled artisan would understand that the Applicants had possession of the subject matter shown therein at the time the application was filed, the new figure adds no new matter.

The drawings have been objected to because reference numeral 1 was used to indicate both the tubular envelope and the source. The replacement drawings correctly identify the source as element 11. This reference numeral has also been corrected in the Substitute Specification at paragraph 0033.

The drawings have been objected to for allegedly failing to show how the plate 3 and diaphragm 2 work together to form a molecular beam. It is respectfully submitted that the cooperation between the plate and the diaphragm would be clear to one skilled in the art based on Figs. 1 and 2 and the written description thereof. The larger scale provided by the replacement sheets and the inclusion of reference numerals 6 and 11 make the cooperation even more clear. Fig. 1 shows the plate 3 in the open position. In this position, epitaxy material from the source 11 is able to form the molecular beam at the level of the annular zone 6 surrounding the plate 3. The reactive species from the source 11 can enter the space between the plate 3 and the diaphragm 2. As described in paragraph 0024 of the specification, the position of the plate 3 relative to the diaphragm 2 allows the reactive species from the source to rebound between the surface of the diaphragm, the wall of the plate and the interior surface of the epitaxy chamber.

The flow of the reactive species is controlled by adjusting the position of the plate relative to the diaphragm to increase or decrease the space between them. The diaphragm is perforated to allow

reactive species within the space to enter into the cavity, which is defined by the tubular member 1 and the diaphragm 2, in the form of the molecular beam. As noted at paragraph 0032 of the Substitute Specification, the tubular member and perforated diaphragm are known in the art.

Fig. 2 shows the plate in the closed position, in which it is pressed against the diaphragm. In this position, the space between the plate and the diaphragm is closed so that reactive species from the source 11 cannot enter. Consequently, the reactive species cannot pass through the diaphragm to enter the cavity. Thus, in light of the above explanation of Figs. 1 and 2 and the supporting description in the specification, one skilled in the art would understand how the plate and diaphragm work together to form a molecular beam.

The drawings have been objected to because reference numeral 3 was not included in Fig. 1, and the scale of the drawings was allegedly inadequate to clearly show the opening between the plate and the diaphragm. As noted above, the scale of Figs. 1 and 2 has been increased to more clearly show the opening. In addition, reference numeral 3 has been added to Fig. 1.

The drawings have been objected to under 37 C.F.R. § 1.84(p)(5) because the numerals 0, 1, 2, 4, 8 and 16 appeared in original Fig. 6 (new Fig. 7), but were allegedly not described in the specification. These numerals have been deleted from new Fig. 7.

For the reasons set forth above, it is believed that the drawings now more clearly show the elements of the claimed invention. It is respectfully requested that the objections to the drawings be reconsidered and withdrawn.

### **Objections to the Specification**

The specification has been objected to because it allegedly did not include a complete written description of the subject matter found in the drawings. Several passages have been added to the

Substitute Specification to more clearly describe the structure shown in the drawings. Because the features of the drawings are now described in the specification, it requested that the objection to the specification be reconsidered and withdrawn.

#### **Claim Rejection Under 35 U.S.C. § 112 ¶ 1**

Claims 1-9 have been rejected under 35 U.S.C. § 112, first paragraph, for allegedly failing to comply with the enablement requirement. In connection with this rejection, the Official Action recommends that a passage be added to the specification to describe how the plate 3 is moved between the open and closed positions. The Examiner's helpful suggestion has been adopted. A new description of the process, which is similar to that suggested in the Official Action, has been added to the Substitute Specification at paragraph 0034. The Examiner's observation that this description is sufficiently supported by Figs. 1, 2 and 4 is noted with appreciation.

Claims 1-9 have been rejected under 35 U.S.C. § 112, first paragraph, because the connecting flange recited in claim 1 is allegedly not described in the specification. It is respectfully submitted that the connecting flange is described at paragraphs 0013 of the translation of the original specification. In addition, the connecting flange has been identified using reference numeral 12 in new Figs. 1 and 2, and descriptions of the connecting flange now appear in the Substitute Specification at paragraphs 0004, 0022, 0032 and 0036. It is believed that the Substitute Specification and identification of the connecting flange 12 in the drawings more clearly describe the connecting flange.

Claims 1-9 have been rejected under 35 U.S.C. § 112, first paragraph, because the subject matter of claim 5 is allegedly not described in such a way to enable one skilled in the art to make the claimed apparatus. As explained above, new Fig. 5 has been added to the application to show the

subject matter of claim 5. In addition, paragraph 0036 has been added to the application to more clearly describe the subject matter.

For reasons similar to those explained in connection with the drawing amendment, the addition of paragraph 0036 adds no new matter. Specifically, the amended description relates to the second embodiment of the invention (shown in new Fig. 5) that was described in original paragraph 0019 and original claim 5. In this embodiment, the plate 3' is angularly mobile to form a dihedron with the plane of the diaphragm. (The meaning of the term "dihedron" is discussed below.) Based on the original description, one skilled in the art would understand that the angular mobility could be accomplished by any pivotal connection, which are well know, between the plate 3' and a structure in the plane of the diaphragm. As shown in the original drawings, the connecting flange (now labeled element 12) is one of the structures in the plane of the connecting flange. Therefore, one skilled in the art would have understood that the pivotal connection could be located at the connecting flange based on the original disclosure. Thus, new paragraph 0036 introduces no new matter.

In light of new Fig. 5 and new paragraph 0036, it is respectfully submitted that the subject matter of claim 5 is shown and described in the specification in such a way so as to enable one skilled in the art to make and use the invention.

In light of the amendments to the specification and drawings and for the reasons set forth above, it is requested that the rejections under 35 U.S.C. § 112, first paragraph, be reconsidered and withdrawn.

#### **Claim Rejection Under 35 U.S.C. § 112 ¶ 2**

Claims 1-9 have been rejected under 35 U.S.C. § 112, second paragraph, for being allegedly

indefinite based on the term “a section” in claim 1. The term “section” has been replaced with the term “cross section”. Based on paragraph 12 of the Official Action, it is believed that the Examiner considers the term “cross section” to be definite. The Applicants agree, and have adopted the model language.

Previously dependent claim 5 has been rejected under 35 U.S.C. § 112, second paragraph, because the recited subject matter is considered inconsistent with independent claim 1. Specifically, the Official Action points out that the distance between the plate and the diaphragm cannot be variable, as recited in claim 1, while the plate is angularly mobile so as to form a dihedron variable with a plane of the diaphragm, as recited in claim 5. The Examiner’s thoughtful analysis is appreciated. Claim 5 has been rewritten into independent form and to include the relevant (and consistent) elements of claim 1.

Rather than reciting that the distance between the plate and the diaphragm is variable, newly independent claim 5 recites that the distance from the center of the plate to the exterior surface of the diaphragm is variable. The recitation of this feature does not represent new matter because, as one skilled in the art would appreciate, the feature is inherent to the angularly mobile plate that forms a dihedron variable with the plane of the diaphragm.

Claim 5 has been rejected under 35 U.S.C. § 112, second paragraph, because “dihedron” is allegedly not a word and is not defined in the specification. It is respectfully submitted that the term “dihedron” is, in fact, a word. According to the *New Webster’s Dictionary of the English Language* (1981), a dihedron is a figure formed by two intersecting planes. A copy of page 280 of the dictionary is enclosed. *See*, definition of “dihedral”. Based on this definition, one skilled in the art would understand the meaning of the recitation, “an angularly mobile plate positioned opposite the

diaphragm such that the plate forms a dihedron variable with a plane of the diaphragm”. Specifically, the plate pivotally moves so that the plate and diaphragm form planes that intersect at a variable angle. Because, the term “dihedron” is a word with an accepted definition, it is respectfully submitted that the claim recitation in which it appears would be clear to one skilled in the art.

Claims 7 has been rejected under 35 U.S.C. § 112, second paragraph, for being allegedly indefinite based on the term “connecting organ”. The Official Action includes a recommendation that the term be replaced by the term “control rod”. The Examiner’s suggestion has been adopted. As such, it is believed that the claim is now clear and definite.

In light of the amendments to the specification, drawings and claims and for the reasons set forth above, it is requested that the rejections under 35 U.S.C. § 112, second paragraph, be reconsidered and withdrawn.

#### **Allowable Subject Matter**

The comments set forth in the Official Action with regard to allowable subject matter are appreciated. The Examiner’s characterization of the invention is substantially correct with respect to claims 1-4 and 6-9. Because the various matters as to form and issues under 35 U.S.C. § 112 set forth in the Official Action are believed to be overcome, claims 1-4 and 6-9 are now in condition for allowance.

Claim 5 is distinguishable from claims 1-4 and 6-9 because claim 5 is directed to the embodiment in which the plate is angularly mobile to form a dihedron with the plane of the diaphragm. In this embodiment, the plane of the plate does not remain parallel with the plane of the diaphragm when in the open position. Because the various objections and rejections relating to claim 5 are believed to be overcome, this claim is also believed to be patentable.



### **Conclusion**

For the foregoing reasons, it is respectfully requested that all of the rejections and objections set forth in the Official Action be reconsidered and withdrawn. It is believed that the application is now in condition for allowance, which action is respectfully requested. If the Examiner believes that the correction of any additional matters of form or other minor matters would advance the application, the Examiner is invited to telephone the undersigned attorney for Applicants.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Steven A. Nash", with a large, stylized loop at the end.

Steven A. Nash  
Reg. No. 45,507  
Attorney for Applicants

SAN:vbmm  
(215) 656-3305

# **New Webster's Dictionary**

**of the English Language**



BEST AVAILABLE COPY

removing material, often followed by through; to search through; *Brit. colloq.* to dwell as a renter or lodger.—*dig in*, to excavate trenches, esp. for defense in battle; to entrench oneself in a position, either physically or figuratively. To begin to apply oneself vigorously, as to one's work or to eating a meal; also *dig in to*.—*n.* A sharp poke; an unkind remark. The site of an archaeological excavation; the excavation; *pl. Brit. colloq.* lodgings; also *diggings*. *dig-a-my*, *dig-a-mē*, *n.* [*L.L. digamia*, < *Gr. digamos*.] Second marriage; the act of marrying again after a first marriage has been legally ended by divorce or by the death of one's first spouse.—*dig-a-mist*, *n.*—*dig-a-mous*, *adj.*

*di-gas-tric*, *di-gas'trik*, *a.* [*Gr. di-*, double, and *gaster*, belly.] *Anat.* of a muscle, having a double belly.—*n.* A double muscle that pulls the lower jaw downward and backward.

*Dig-by chick-en*, *n.* *Canadian*, a herring that has been smoke-cured.

*di-gen'e-sis*, *di-jen'i-sis*, *n.* *Biol.* successive generation by two different processes, as sexual and asexual.—*di-ge-net-ic*, *di'je-net'ik*, *a.*

*di-gest*, *di-jest'*, *di-jest'*, *v.t.* [*L. digero*, *digestum*, to distribute, dispose, digest food.—*di-* for *dis-*, asunder, and *gero*, *gestum*, to bear.] To convert, as food or drink, in the alimentary canal into a form absorbable by the body tissues; to arrange methodically in the mind; to think out; to order for being conveniently consulted or studied; classify; to summarize; to abridge; *chem.* to soften, decompose, or prepare, as with heat, moisture, or chemicals; *fig.* to bear with patience or with an effort; brook; put up with.—*v.i.* To undergo digestion; as food; to digest food or drink; *chem.* to be digested by means of heat, moisture, or chemicals.—*di-jest*, *n.* A systematic compilation, as of literary or scientific material, frequently abridged or summarized; *law*, a compilation or synopsis, as of statutes or court decisions, systematically arranged.—the *Di-gest*, a collection of Roman laws, arranged under proper titles by order of the Emperor Justinian.—*di-gest-er*, *n.* One who digests; one who compiles a digest; that which assists the digestion of food; *chem.* a vessel in which substances may be digested.—*di-gest-i-ble*, *a.*—*di-gest-i-bil-i-ty*, *di-gest-i-ble-ness*, *n.*

*di-ges-tion*, *di-jes'chan*, *di-jesh'chan*, *di-jesh'chan*, *n.* [*L. digestio*.] The process which food undergoes, primarily through the action of enzymes in the alimentary canal, whereby it is prepared for absorption into and nourishment of the body tissues; *chem.* a process whereby substances are treated, as with heat, moisture, or chemicals, to change their state or composition; the state resulting from either of these processes; the act, function, or operation of digesting; the ability to digest.—*n.* Any preparation or medicine which aids digestion.—*di-ges-tive*, *di-jes'tiv*, *di-jes'tiv*, *a.* Pertaining to digestion; having the power to promote digestion.—*di-ges-tive-ly*, *adv.*—*di-ges-tive-ness*, *n.*

*dig-ger*, *dig'ēr*, *n.* One who or that which digs; an implement or machine for digging. (*Cap.*) a member of any of several Indian tribes of western N. America that used roots as a major item of diet; also *Dig-ger In-di-an*.

*dig-ger wasp*, *n.* Any of a large group of solitary wasps of the family *Sphæcidae*, most of which build their nests in burrows in the ground and provision them for their young with the bodies of spiders or insects which they have paralyzed by stinging.

*dig-gings*, *dig'ingz*, *n. pl.* Sometimes constr. as *sing.* An area of excavation, esp. a mining

area. Material removed from an excavation.

—*dig'inz*, *Brit. colloq.* lodgings.

*dig-it*, *dij'it*, *n.* [*L. digitus*, a finger.] A finger or a toe; the breadth of a finger, or  $\frac{1}{4}$  inch; *astron.* the twelfth part of the diameter of the sun or moon; *arith.* any positive integer under 10, including 0, so called from counting on the fingers.—*dig-it-al*, *dij'i-tal*, *a.* [*L. digitalis*.] Of or pertaining to digits; resembling a finger or fingers; also *digitate*.—*n.* A key of the organ, piano, or other keyboard instrument.

*dig-it-al com-put-er*, *n.* A computer in which information is represented in discrete units; using coded digits to indicate all the variables of a problem and providing solutions calculated mathematically, esp. in a binary system.

*dig-i-tal-in*, *dij'i-tal'in*, *dij'i-tā'lin*, *n.* A white, crystalline powder,  $C_{20}H_{36}O_{14}$ , a glucoside of digitalis used in medicine; any of several mixtures of glucosides extracted from digitalis.

*dig-i-tal-is*, *dij'i-tal'is*, *dij'i-tā'lis*, *n.* Any of several Eurasian herbs of the genus *Digitalis* of the figwort family, esp. *D. purpurea*; the common foxglove; the dried and powdered leaf of foxglove containing several important glucosides and serving as a powerful heart stimulant and a diuretic.—*dig-i-tal-ize*, *dij'i-tal-iz'*, *dij-i-tal'iz*, *v.t.*—*digitalized*, *digitalizing*. *Med.* to administer digitalis to in the treatment of heart disease.—*dig-i-tal-iz-a-tion*, *n.* *Med.* the process of administering digitalis in the course of treatment; the physiological effect induced by this.

*dig-i-tate*, *dij'i-tāt'*, *a.* *Bot.* having sections or parts, as leaflets, radiating like the fingers on a hand; *zool.* possessing digits or digitlike appendages. Also *dig-i-tat-ed*.—*dig-i-tate-ly*, *adv.*—*dig-i-ta-tion*, *dij'i-tā'shan*, *n.* *Biol.* a division into fingerlike appendages or parts; any of such appendages or parts.

*dig-i-ti-grade*, *dij'i-ti-grād'*, *n.* [*L. digitus*, and *gradior*, to go.] An animal that walks on its toes, as the dog or cat.—*a.* Walking on the toes without any weight put on the sole of the foot.

*dig-i-tox-in*, *dij'i-tok'sin*, *n.* A bitter, odorless, white, highly poisonous leaflet or powder,  $C_{41}H_{64}O_{13}$ , the most active glucoside of digitalis, used as a heart stimulant; a cardiotonic mixture of digitalis glucosides, primarily digitoxin.

*di-glot*, *di'glot*, *a.* [*Gr. diglottos*, < *di-*, two, and *glotta*, *glossa*, tongue.] Using or containing two languages; bilingual.—*n.* A bilingual book or edition.—*di-glot-tic*, *di'glot'ik*, *a.*

*dig-ni-fied*, *dig'ni-fid'*, *a.* Invested with dignity; marked with dignity or loftiness; noble; stately in deportment.—*dig-ni-fied-ly*, *adv.*

*dig-ni-fy*, *dig'ni-fi'*, *v.t.*—*dignified*, *digni-fying*. [*Fr. dignifier*—*L. dignus*, worthy, and *facere*, to make.] To invest with honor or dignity; to elevate to a high office; to honor; to try to bestow undeserved dignity upon; to give a prestigious name or title to.

*dig-ni-tary*, *dig'ni-ter'ē*, *n. pl.* *dig-ni-tar-ies*. One who holds high rank or office, esp. in government.—*dig-ni-tar-i-al*, *a.*

*dig-ni-ty*, *dig'ni-tē*, *n. pl.* *dig-ni-ties*. [*L. dignitas*.] Formal or restrained deportment, demeanor, or speech; self-respect; majesty or stateliness; the state or quality of being worthy of respect, honor, or esteem; comparative importance, place, or excellence; rank; an elevated position, title, or rank.

*di-graph*, *di'graf*; *di'gräf*, *n.* [*Gr.*] A union of two vowels or of two consonants, representing a single sound of the voice, as *ea* in *head*.—*di-graph-ic*, *di'graf'ik*, *a.*

*di-gress*, *di-gres'*, *di-gres'*, *v.i.* [*L. digredior*,

*digressus*, to step apart.] To depart or wander from the main subject of a discourse, argument, or narration.

*di-gres-sion*, *di-gresh'an*, *di-gresh'an*, *n.* [*L. digressio*.] The act of digressing; the part or passage of a discourse which deviates from the main subject.—*di-gres-sion-al*, *a.*

*di-gres-sive*, *di-gres'iv*, *di-gres'iv*, *a.* Apt to digress; characterizing or characterized by digression.—*di-gres-sive-ly*, *adv.*—*di-gres-sive-ness*, *n.*

*di-he-dral*, *di-hē'dral*, *a.* [*Gr. di-*, two, and *hedra*, seat, base.] Having, or formed by, two plane faces; two sided; pertaining to or having a dihedral angle; *aeron.* pertaining to the upward or, rarely, downward slant of an aircraft wing or tailplane.—*di-he-dral an-gle*, *n.* *Geom.* the angle between two intersecting planes.

*di-he-dral*, *di-hē'dral*, *n.* *Geom.* a figure formed by two intersecting planes; also *dihedral angle*, *di-he-dron*. *Aeron.* the upward (positive) or downward (negative) incline of an aircraft's wing or other supporting surface in relation to the horizontal; esp. the angle thus formed.

*di-hy-brid*, *di-hi'brid*, *n.* *Biol.* the offspring or strain produced by parents which differ in two specific genetic factors.—*a.*

*di-kast*, *dik'ast*, *dik'ast*, *n.* *Dicast*.

*dik-dik*, *dik'dik'*, *n.* [A native East Afr. name.] Any of several small African antelopes, of the genera *Madoqua* and *Rhynchotragus*, which stand twelve to fourteen inches high.

*dike*, *dik*, *n.* [*O.E. dic*, *D. dijk*, *Dan. dige*, a bank of earth, a ditch, the ditch being excavated and the bank formed by the same operation. *Ditch* is a softened form of this.] An embankment constructed to restrain flood waters; an artificially created waterway, as a ditch; a bank of debris that results from material being excavated; a raised causeway; a barrier or obstacle; *Brit.* a low wall of earth or stone to enclose land. *Geol.* a tabular mass of igneous rock which has intruded, while molten, into fissures of older rock beds. Also *dyke*.—*v.t.*—*diked*, *diking*. To surround with a dike; to secure by a bank; to drain by one or more dikes or ditches.

*di-lac-er-ate*, *di-las'e-rāt'*, *di-las'e-rāt'*, *v.t.*—*dilacerated*, *dilacerating*. [*L. dilacerō*.] To tear into pieces; to rend asunder.

—*di-lac-er-a-tion*, *n.*

*di-lap-i-date*, *di-lap'i-dāt'*, *v.t.*—*dilapidated*, *dilapidating*. [*L.*] To cause to decay or fall into partial ruin through misuse or neglect.—*v.i.* To fall to partial ruin.—*di-lap-i-da-tion*, *n.*—*di-lap-i-dā-tor*, *n.*

*di-lap-i-dat-ed*, *di-lap'i-dā'id*, *a.* In a run-down condition; reduced to decay.

*di-lat-an-cy*, *di-lāt'an-sē*, *di-lāt'an-sē*, *n.* The property of dilating. *Phys.* the property of granular masses of expanding in the volume they occupy when they change in shape, due to the increase of space between the particles; the property of some suspensions or colloids which increase in viscosity, and set to a solid, due to pressure, agitation, or expansion, as quicksand or wet sand.—*di-lāt-ant*, *di-lāt'ant*, *di-lāt'ant*, *a.* Dilating or expanding; pertaining to or characterized by dilatancy.—*n.* An agent or instrument that dilates something; a surgeon's dilator; a substance having the property of dilating or expanding; a substance having the property of dilatancy.

*dil-a-ta-tion*, *dil'a-tā'shan*, *di-la-tā'shan*, *n.* The act of expanding, or dilating; the state of being expanded or distended; something which is dilated. *Med.* a pathological enlargement, as of an organ or passageway; an induced, temporary enlargement of an opening or passageway, as to aid examina-

*ch-chain*, G. nacht; *th-Then*, thin; *w-wig*, hw as sound in whig; *z-zh* as in azure, zeal. *Italicized vowel* indicates schwa sound.